

8-inch reflector and a 4-inch refractor by Cooke, of York. His intention to resume astronomical work in 1882 was frustrated by an attack of rheumatic fever, and he was compelled to limit himself to indoor work with the microscope.

He was elected a Fellow on 1882 March 10, but contributed no papers to the Society.

JOHN MORGAN was born at Gretna on 1809 December 7. He was the younger son of the Rev. John Morgan, minister of the parish of Gretna, Dumfriesshire. In early life he went to Cartagena, in South America, and afterwards spent some years in business in Trinidad, returning with a modest fortune in 1842. Very shortly after, he came to reside at Springfield House, Bishopbriggs, with his brother William Morgan, an East India merchant, who died in 1856. Unmarried and of a retiring disposition, Mr. John Morgan lived in quiet seclusion at Springfield till his death, which took place on 1894 May 4.

ARTHUR COWPER RANYARD was born at Swanscombe, in the county of Kent, on 1845 June 21, and, after his father's removal to 13 Hunter Street, Brunswick Square, he was educated at University College School, Gower Street. On leaving the school he entered the adjoining college, where, from the influence of the late Professor De Morgan, whose classes he attended, he acquired a strong love for mathematics and astronomy. Whilst at University College he collaborated with Mr. George De Morgan in founding a "Students' Mathematical Society," which had a most successful career, developing eventually into the present "London Mathematical Society." Mr. Ranyard read the first paper before the new society, one "On Determinants."

From University College, London, Mr. Ranyard went to Cambridge, entering on residence at Pembroke College in the October term of 1865, and taking his degree in 1868. Three years later he was called to the Bar at Lincoln's Inn, but, whilst adopting the law as his profession, his leisure hours were mostly devoted to science. Thus he joined the Physical Society in its first session, and in 1872 worked with Lord Lindsay (the present Earl of Crawford) in the study of photographic irradiation. Again in 1885 and 1886 the same subject of photography occupied his attention, and he conducted a number of experiments in order to determine the relations between the length of exposure and the intensity of photographic action.

His connection with Lincoln's Inn gave scope for the exercise of another side of his character, his interest in relics of the past. The preservation of ancient monuments appealed strongly to him, and he took a great part in saving the old gateway of Lincoln's Inn from destruction, and also the houses in "Old Buildings," including Lord Thurlow's chambers. In the latter he was especially interested, as the character of Cromwell himself, and

the incidents of the Cromwellian *régime* had been a favourite subject of study with him.

His chief work as an astronomical observer consisted in his observations of the three total solar eclipses of 1872, 1878, and 1882. On the first occasion he was one of the observers sent out by the Joint Committee of the Royal and Royal Astronomical Societies, and was stationed at Villasmunda, near Augusta, Sicily. He was here favoured with much better fortune than awaited most of his colleagues, and was afforded a fine view of the phenomena of totality. The observations assigned to him were polariscopic, and he carried them out with entire success, repeating, with a few additional details, those made by Prazmowski in 1860. His expeditions to America to view the total solar eclipse of 1878, and to Egypt to view that of 1882, were made at his own expense, and he went on his own responsibility. He was contemplating an important work in the department of solar physics on the lines opened up by M. Deslandres and Professor Hale, when the disease which afterwards proved fatal laid its hand upon him. He had had a spectroheliograph constructed for him, and this he lent to Professor Hale for the latter's expedition to Etna to attempt the photographing of the corona in full sunshine. Mr. Ranyard never had the opportunity of using the instrument himself, and it lay in its cases, not yet unpacked, at the time of his death. He willed it, together with the Calver reflecting telescope, for which it was designed, to Mr. J. Evershed, a Fellow of this Society.

Mr. R. A. Proctor's sudden death in 1887 left the publication of his great work, *Old and New Astronomy*, in a most unfinished state, and his magazine, *Knowledge*, without an editor. It was exceedingly typical of Mr. Ranyard's generous spirit that he cheerfully undertook the immense amount of hard work, extending over many months, which the completion of the *Old and New Astronomy* involved, in order to sustain the reputation of his deceased friend and to assist his family. And difficult as it was to follow a man of Proctor's ability, and to sustain his work upon an equal level, Mr. Ranyard fully succeeded in the task.

The subjects which he chiefly discussed in these two publications were: the conditions of the various envelopes of the Sun, the structure of the solar corona, the structure and dimensions of the stellar universe, the distance of the Milky Way, and the density of nebulae, of the great *Orion* nebula in particular. The especial feature which he introduced into *Knowledge* was the reproduction of a number of important astronomical photographs, a feature very gratefully welcomed by many astronomical amateurs. He devoted also considerable space to the reproduction of photographs of lightning and to the discussion of the phenomena of "ribbon flashes" and "dark flashes."

Another publication undertaken by Mr. Ranyard was that of Professor De Morgan's little brochure, *Sir Isaac Newton, his Friend, and his Niece*, to which he supplied a preface. Nor

was the reputation of Sir Isaac Newton the only one in which he was interested. He was anxious that the gifted young pioneer of English astronomy should have due honour rendered to him, and was instrumental in having a memorial tablet erected to Jeremiah Horrox in Westminster Abbey.

He took an active part in public affairs and was very earnest in promoting the establishment of the St. Giles's Public Library, of which he was one of the Commissioners. He consented to stand as one of the candidates for the Holborn Division in the County Council election of 1892. His good temper and evident straightforwardness and honesty made the most favourable impression on the electors, and he and his colleague, Mr. Remnant, were the only two candidates of their party who succeeded in winning seats from their opponents at that election. Many of his friends feared that he was thus taking a burden upon him too heavy for his strength, knowing the thorough conscientiousness with which he discharged every duty that he undertook. Thus, in the year ending March, 1893, he had attended every meeting of the County Council, and almost every meeting of the committees on which he was serving. Of these the one in which he effected the most important work was the Building Acts Committee, especially in connection with the New (London) Building Act, with reference to which he gave evidence before a Select Committee of the House of Commons.

His connection with the Royal Astronomical Society began at an unusually early age, he having been elected a Fellow when only 18. His first work in an official capacity was in the preparation and organisation of the Eclipse Expedition of 1870; Mr. J. Norman Lockyer being appointed Secretary of the Joint Eclipse Committee of the Royal and Royal Astronomical Societies, and Mr. Ranyard, Assistant-Secretary. He was elected to a seat on the Council in February, 1872, and to the Secretaryship in February, 1874. This office, which he retained till 1880, he filled with conspicuous industry and courtesy. During his tenure of this office he brought out vol. xli. of the *Memoirs*, the great "Eclipse" volume. In its inception it was intended to be a report of the eclipses of 1860 and 1870, and at first Mr. Ranyard worked with the assistance and under the oversight of Sir G. B. Airy, then Astronomer Royal. Soon, however, the entire work devolved upon him, and its scope was extended until it embraced the collation and arrangement of the known observations of all eclipses down to 1878. This work, most admirably designed, and most laborious in execution, was not published until 1879.

Including the years of his secretariate, he sat nineteen years upon the Council.

Early in the summer of 1894 a mysterious loss of weight and other disquieting symptoms began to make themselves apparent. These were eventually traced to the formation of an internal cancer which all but precluded the possibility of nourishment

entering the system. After a long and most trying illness, borne with great patience and hopefulness, he died on December 14, 1894, whilst the meeting of the Royal Astronomical Society, in the welfare of which he took from first to last so keen an interest, was in session. Mr. Ranyard was not married, and only one of his immediate relatives, a brother in Australia, survived him. But his purity of motive, his generous spirit, his freedom from self-seeking, and his unfailing courtesy of manner, endeared him to a large circle of friends who will keenly feel his loss. Amongst these will be numbered not a few of the most distinguished foreign astronomers, Mr. Ranyard having been an excellent linguist, and frequently visiting the Continent. He was elected a Fellow of the Society 1863 November 13.

HENRY ROE was born at Corfe Castle, Dorset, on 1833 October 22. At the age of nineteen he became tutor and Government Lecturer in Mathematics at the Metropolitan Training Institute, Highbury, and held this office till 1865, when he took Orders and was appointed to the Head Mastership of Kington Middle School, and the Curacy of Combroke. While holding these offices he became Evening Lecturer at Tysoe (1869-75), and then for a short time Chaplain of Chadshunt. In 1876 he was presented to Poyntington and made Chaplain of the Sherborne Union, and was for seven years (1877-84) also Assistant Diocesan Inspector. He remained at Poyntington for twelve years, for the last eight of which he was Curate of Sherborne. In 1883 he became Rural Dean of Merston; in 1884 Diocesan Inspector for the Archdeaconry of Taunton, and the Rural Deaneries of Mers-ton, Ilchester, and Paulet; and in 1886 he was made Prebendary of Ilton in Wells Cathedral. He was appointed to Yeovilton in 1888 by the Bishop of the diocese.

Prebendary Roe was on the General Committee of the Exeter Congress and a member of the small but very important "Subjects Committee." He married in 1858 and leaves two sons and two daughters. He died at Yeovilton Rectory on 1894 September 16 after a four days' illness, and his widow only survived him by seventeen days.

He was elected a Fellow on 1864 February 12, but contributed no papers to the Society.

WILLIAM TOMLINSON was born at Ilkley, Yorkshire, on 1809 December 4. In 1846 he became a master in the Royal School of St. Peter at York, where he was subsequently placed at the head of the Civil and Military Department. This post he retained until his resignation in 1873. In 1882 he left York for the milder climate of Sandown, Isle of Wight, where he died, 1894 January 17.

Mr. Tomlinson attained a considerable reputation as a successful and enthusiastic schoolmaster throughout the country. He was an able mathematician and an ardent lover of the natural